

WHAT IS CLAIMED:

1. A comb-line filter comprising:
 - a) a housing comprising:
 - i. a first portion made of a dielectric material; and
 - ii. a second portion made of a conductive material,
said first portion and said second portion adapted for being attached together so as to define an interior chamber for conducting signals;
 - b) at least one resonator attached to said second portion, and adapted for extending within the interior chamber when said first portion and said second portion are attached.
2. A comb-line filter as defined in claim 1, wherein said first portion is made of plastic.
3. A comb-line filter as defined in claim 1, wherein said at least one resonator and said second portion are made of said conductive material.
4. A comb-line filter as defined in claim 1, wherein said at least one resonator is made of at least one metal material.
5. A comb-line filter as defined in claim 1, wherein said at least one resonator is made of a ceramic material.
6. A comb-line filter as defined in claim 1, wherein said at least one resonator is made of a thermoplastic material.
7. A comb-line filter as defined in claim 3, wherein said conductive material includes aluminum.
8. A comb-line filter as defined in claim 1, wherein said first portion includes an inner surface and said second portion includes an interior

surface, said inner surface and said interior surface defining said interior chamber, said inner surface and said interior surface being provided with a conductive layer.

9. A comb-line filter as defined in claim 8, wherein said conductive layer includes silver.

10. A comb-line filter as defined in claim 8, wherein said inner surface is provided with a conductive layer having a different conductivity than the conductive layer of said interior surface.

11. A comb-line filter as defined in claim 1, wherein when said first portion and said second portion are attached together, said interior chamber is defined by a top wall, a lower wall and at least one side wall connecting said top wall to said bottom wall.

12. A comb-line filter as defined in claim 11, wherein said first portion includes said at least one side wall.

13. A comb-line filter as defined in claim 12, wherein said interior chamber includes a signal pathway when said first portion and said second portion are attached together, said signal pathway being defined by at least one interior wall .

14. A comb-line filter as defined in claim 11, further comprising a plurality of tuning screws for adjusting a response characteristic of said filter.

15. A comb-line filter as defined in claim 14, wherein said plurality of tuning screws are connected to said first portion of said housing.

16. A comb-line filter as defined in claim 14, wherein said plurality of tuning screws are connected to said second portion of said housing.

17. A comb-line filter as defined in claim 16, wherein at least one of said plurality of tuning screws extends through a center of a respective one of said at least one resonator.

18. A comb-line filter as defined in claim 14, wherein said second portion comprises a first part that forms said top wall, and a second part that forms said bottom wall, said at least one resonator being attached to said first part and said plurality of tuning screws being connected to said second part.

19. A comb-line filter as defined in claim 1, wherein said dielectric material and said conductive material have thermally compatible respective coefficients of thermal expansion.

20. A comb-line filter as defined in claim 12, wherein said dielectric material and said conductive material have respective coefficients of thermal expansion within 10% of one another.

21. A comb-line filter as defined in claim 11, further comprising a plurality of coupling screws for adjusting a response characteristic of said filter.

22. A comb-line filter as defined in claim 21, wherein said plurality of coupling screws are connected to said first portion of said housing.

23. A comb-line filter as defined in claim 1, wherein said dielectric material is of a first density and said conductive material is of a second density, said first density being less than said second density.

24. A method of manufacturing a comb-line filter, comprising:

a) providing a first portion made of a dielectric material;

- b) providing a second portion made of a conductive material, said second portion having at least one resonator connected thereto;
- c) attaching said first portion and said second portion together in order to form an interior chamber suitable for conducting signals.

25. A method as defined in claim 24, wherein said internal chamber is defined by an inner surface of said first portion and an interior surface of said second portion, said method further comprising providing a conductive layer on said inner surface and said interior surface.

26. A method as defined in claim 25, wherein said at least one resonator is configured and positioned on said second portion so as to achieve a desired frequency response.

27. A method as defined in claim 24, wherein said at least one resonators are made separately from said second portion.

28. A comb-line filter comprising:

- a) a housing comprising:
 - i. a first portion made of a material of a first density; and
 - ii. a second portion made of a metal material of a second density, said first density being less than said second density, said first portion and said second portion adapted for being attached together so as to define an interior chamber for conducting signals;
- b) at least one resonator attached to said second portion, and adapted for extending within the interior chamber when said first portion and said second portion are attached.

29. A comb-line filter comprising:

- a) a housing comprising:
 - i. a first portion made of a first material; and

ii. a second portion made of a second material, said second portion being provided with a conductive layer, said conductive layer being more conductive than said first material of said first portion, said first portion and said second portion adapted for being attached together so as to define an interior chamber for conducting signals;

b) at least one resonator attached to said second portion, and adapted for extending within the interior chamber when said first portion and said second portion are attached.

30. A comb-line filter as defined in claim 29, wherein said first portion is provided with a respective conductive layer, said conductive layer of said second portion being more conductive than said conductive layer of said first portion.